BLACK BOX

CASE STUDY
CONSTRUCTION

Transforming Road Sealing Design through Intelligent Automation

Overview

Across New Zealand's varied terrain, a leading infrastructure services provider plays a critical role in keeping the nation moving. Supporting asset owners nationwide, the organisation delivers large-scale road construction and maintenance programmes that underpin the reliability and safety of essential transport networks. With a widely distributed workforce and operations spanning multiple regions, it operates at the heart of the country's infrastructure ecosystem, where precision, speed, and consistency are vital.

At the centre of this operation is a specialised sealing delivery hub responsible for building designs, and planning long-term maintenance. Historically, this process relied on extensive manual analysis of road condition data, such as surface texture, rutting and structural integrity, to determine appropriate programmes of work and lifecycle planning.

Challenges

The existing approach was heavily dependent on thousands of manually maintained spreadsheets, making the design and quoting process time-consuming, inconsistent and difficult to scale. Designers were required to analyse complex datasets, conduct peer reviews, and produce outputs manually, resulting in delays that impacted responsiveness to client requirements.

In addition, critical knowledge resided within a small group of experienced specialists. As these individuals moved on, the risk of knowledge loss increased significantly, exposing the organisation to continuity challenges. Managing multiple regional programmes simultaneously further increased complexity, requiring specialised expertise and limiting operational flexibility.

AT A GLANCE

CHALLENGES

- Manual, spreadsheet-heavy processes slowed design, quoting and scheduling
- Over-reliance on a small group of specialists created a continuity risk
- Complex multi-programme workloads relied on specialist expertise, limiting scalability and resilience

SOLUTIONS

- Development of a centralised, web-based digital engineering platform with a secure, searchable repository of designs
- Automation of design logic, validation and risk assessment workflows
- Built-in geo-lookup to enable faster environmental modelling

RESULTS

- Significant reduction in design and quoting turnaround times
- Improved accuracy, consistency, and scalability of sealing designs
- Enhanced organisational resilience with reduced dependency on key individuals
- Strengthened security, controlled access, authentication, and full version control

BENEFITS

- Increased productivity through reduced workload and more efficient processes
- Improved consistency and confidence in design outputs
- Automated validation and quality controls reduced errors and review time, enabling teams to focus on higher value work
- Improved governance, stronger risk management and better training environments

Solutions

To address these challenges, Black Box developed a centralised, web-based platform designed to streamline the entire sealing design lifecycle. The solution automated key processes, including design modelling, validation, and risk assessment, while ensuring outputs aligned with established sealing standards and client requirements.

The platform incorporated advanced logic and geo-lookup capabilities to account for environmental conditions and regional variables. Security has been strengthened through encrypted data storage, controlled access, and authentication features that allow staff to use the application securely from any location. Version control ensures full traceability of modifications, supports peer review, and upholds the integrity of the process.

A centralised repository was established to store all design data, creating a searchable knowledge base that improved consistency, reduced reliance on individual expertise, and enabled faster, more informed decision-making for clients.

Results

The implementation of the digital engineering platform delivered substantial efficiency gains across the organisation's sealing operations. Tasks that previously took weeks or even months were significantly accelerated, enabling faster quoting, improved responsiveness, and increased throughput. Automation reduced manual effort while enhancing the accuracy and consistency of design outputs.

The organisation now has a scalable, repeatable design process that can be shared across teams. A dedicated sandbox environment provides a safe, secure training space for upskilling team members without affecting live data or disrupting active work.

At the same time, the organisation achieved greater resilience by embedding domain expertise within the system itself. Dependency on individual specialists was reduced, while structured workflows, version control, and validation mechanisms improved quality assurance. Enhanced reporting capabilities also enabled the delivery of more comprehensive, data-driven recommendations to clients.

Why Black Box?

The organisation selected Black Box for its ability to design and deliver complex, high-impact solutions tailored to industry-specific requirements. With deep expertise in systems integration and application development, Black Box translated intricate engineering needs into a scalable, user-friendly platform that addressed both operational and strategic priorities.

Beyond implementation, Black Box delivered a secure, future-ready solution that supports stronger governance, reduced workload and improved quality. Its ability to combine technical precision with practical execution ensured a seamless transition from manual processes to an intelligent, automated framework, positioning the company for long-term efficiency, resilience, and sustainable growth.

Black Box is a global leader in digital infrastructure solutions, delivering network and system integration, managed services, and technology products to Fortune 100 and top global enterprises. With a presence across the United States, Europe, India, Asia Pacific, the Middle East, and Latin America, Black Box serves businesses across financial services, technology, healthcare, retail, public services, and manufacturing.